

REMARKS

Rejections under 35 U.S.C. §§ 102(e), 103(a)

Claim 9 is rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,104,403 to Mukouchi et al. (hereinafter Mukouchi).

Claims 1, 2, and 4 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mukouchi. Claim 3 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Mukouchi in view of U.S. Patent No. 5,594,850 to Noyama et al. (hereinafter Noyama). Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Mukouchi in view of Noyama in further view of U.S. Patent No. 5,905,501 to Kato (hereinafter Kato). Claims 6-8 and 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mukouchi in view of U.S. Patent No. 6,341,291 to Bentley et al. (hereinafter Bentley).

Applicants have cancelled claims 1-10 without prejudice. The rejection of these claims is now moot and is, hence, not addressed herein.

New Claims

Applicants have submitted new claims 11-28. The new claims are supported by the original application. No new matter has been entered.

Claim 11 recites:

- receiving user input to associate two CAD objects, wherein said user input identifies a coupling between said two CAD objects selected from the list consisting of: vertex-to-vertex connection, axis-to-axis connection, edge-to-axis connection, and face-to-face connection;

- displaying said two CAD objects according to the coupling identified by the user input;

- calculating a reduction in degrees of freedom between said two CAD objects caused by said identified coupling; and

- displaying an indication of said reduction in said degrees of freedom in association with the display of said two CAD objects.

Claim 21 recites:

means for defining a virtual environment in which CAD objects are manipulated;
means for receiving input from a user to associate two CAD objects within said virtual environment, wherein said input identifies a coupling between said two CAD objects selected from the list consisting of: vertex-to-vertex connection, axis-to-axis connection, edge-to-axis connection, and face-to-face connection;
means for displaying said two CAD objects according to the identified coupling;
means for determining a reduction in degrees of freedom caused by said identified coupling; and
means for displaying an indication of degrees of freedom associated with said two CAD objects after application of said identified coupling.

Claim 26 recites:

providing a virtual environment in which computer aided design (CAD) objects are manipulated;
receiving input from a user to associate two CAD objects within said virtual environment, wherein said input identifies a coupling selection from a list of predefined connection types;
displaying said two CAD objects according to the identified coupling;
determining a reduction in degrees of freedom caused by said identified coupling;
and
displaying an indication of degrees of freedom associated with said two CAD objects after application of said identified coupling.

Applicants respectfully submit that the applied references do not teach or suggest each and every limitation of claims 11, 21, and 26.

Mukouchi is directed to a computer system in which components may be virtually assembled. *See* Abstract of Mukouchi. Specifically, the user defines “part models in advance and completes a final model through the assembling of the part models on the screen.” Col. 2, lines 39-42. The definition of the part models to be used in the assembly process includes “junction reference data” that represents how parts can be joined together. Col. 2, lines 46-51. During the definition of the junction data, “it is possible to arbitrarily set whether the junction is to be made at a predefined angle upon the junction [of two part models] or the junction is to have a degree of freedom.” *See* col. 12, lines 63-65. Accordingly, there is no necessity of receiving user input to define the type of coupling to be applied, as it is already statically defined. By statically defining the possible connections, the user must decide upon each type of connection for each object before using the Mukouchi modeling software to assemble the CAD objects.

In contrast, the claimed subject matter allows the user to connect any suitable CAD objects according to a number of different connection types. By providing the user such flexibility, the user is provided the ability to assemble complex CAD objects from multiple other subcomponent CAD objects in an interactive and dynamic manner. Constructing such complex CAD objects without predefined restrictions is especially useful in collaborative design environments where multiple users are concurrently participating in the design process.

Noyama is merely directed to methods for processing computer graphics data. *See* Abstract. Accordingly, Noyama is not directed to CAD objects and does not teach or suggest coupling CAD objects in the manner recited by claims 11, 21, and 26.

Kato is directed to a system for generating a two dimensional view of a three dimensional CAD object. Kato does not teach or suggest coupling CAD objects in the manner recited by claims 11, 21, and 26.

Bentley is merely directed to a CAD system in which multiple remote users may modify a centrally stored CAD model. Bentley does not teach or suggest coupling CAD objects in the manner recited by claims 11, 21, and 26.

Thus, the applied references (either alone or in combination) do not teach or suggest each and every limitation of claims 11, 21, and 26. Claims 12-20, 22-25, 27, and 28 respectively depend from base claims 11, 21, and 26 and, hence, inherit all limitations of their base claims. Accordingly, Applicants respectfully submit that claims 11-28 are patentable over the applied references.

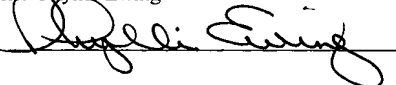
Conclusion

In view of the above amendment, Applicant believe the pending application is in condition for allowance. Applicants believe no fee is due with this response. However, if a fee is due, please charge Deposit Account No. 08-2025, under Order No. 20001670-4 from which the undersigned is authorized to draw.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as Express Mail, Airbill No. EV482738207US in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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